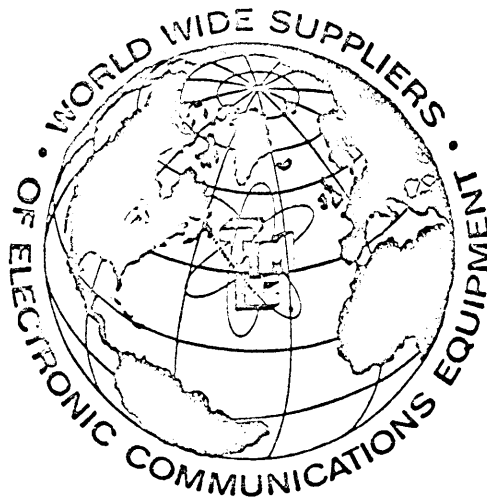
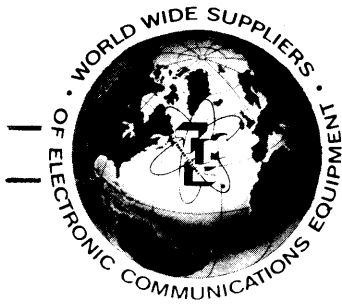


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TECHNICAL MANUAL
for
RECEIVER, SELECTOR
MODEL RTRS-1
(MK-6759/FRR-72)



THE TECHNICAL MATERIEL CORPORATION
MAMARONECK, N.Y. OTTAWA, ONTARIO



THE TECHNICAL MATERIEL CORPORATION

C O M M U N I C A T I O N S E N G I N E E R S

700 FENIMORE ROAD

MAMARONECK, N. Y.

W a r r a n t y

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes, fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

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SECTION 1

GENERAL DESCRIPTION

1-1. FUNCTIONAL DESCRIPTION

RECEIVER SELECTOR, Model RTRS-1 (figure 1-1) is functionally used as a receiver selector in remote controlled applications.

The RECEIVER SELECTOR, Model RTRS-1 (hereafter referred to as the RTRS) manually routes, by means of front panel mounted pushbuttons, a tuning code to an external programming device for selection of either of two remote receivers to be tuned.

1-2. PHYSICAL DESCRIPTION

The RTRS is equipped with a 19 inch wide front panel, suitable for mounting into any standard width equipment rack or console.

The front panel measures 3-1/2 inches high, designed to be screw-fastened to a rack frame.

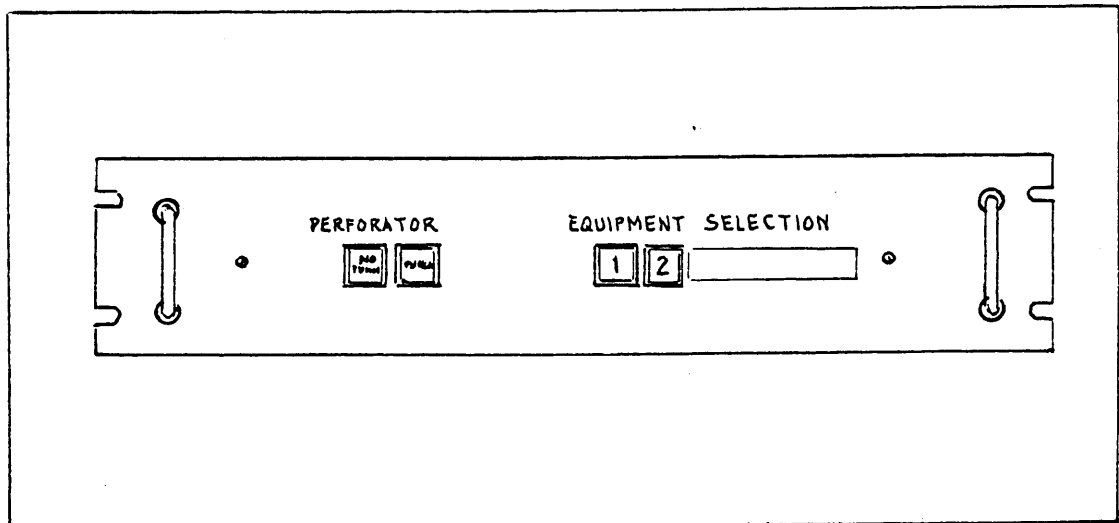


Figure 1-1. Receiver Selector, Model RTRS-1.

SECTION 2
INSTALLATION

2-1. INITIAL INSPECTION

Each RTRS has been thoroughly checked and tested at the factory before shipment. Upon arrival at the operating site, inspect the packing case and its contents immediately for possible damage. Unpack the equipment carefully. Inspect all packing material for parts which may have been shipped as loose items.

With respect to damage to the equipment for which the carrier is liable, The Technical Materiel Corporation will assist in describing methods of repair and the furnishing of replacement parts.

2-2. MECHANICAL INSTALLATION

The RTRS is equipped with a 19 inch wide rack panel, designed to be mounted into any standard width equipment rack or console. The panel is to be screw fastened to the rack frame.

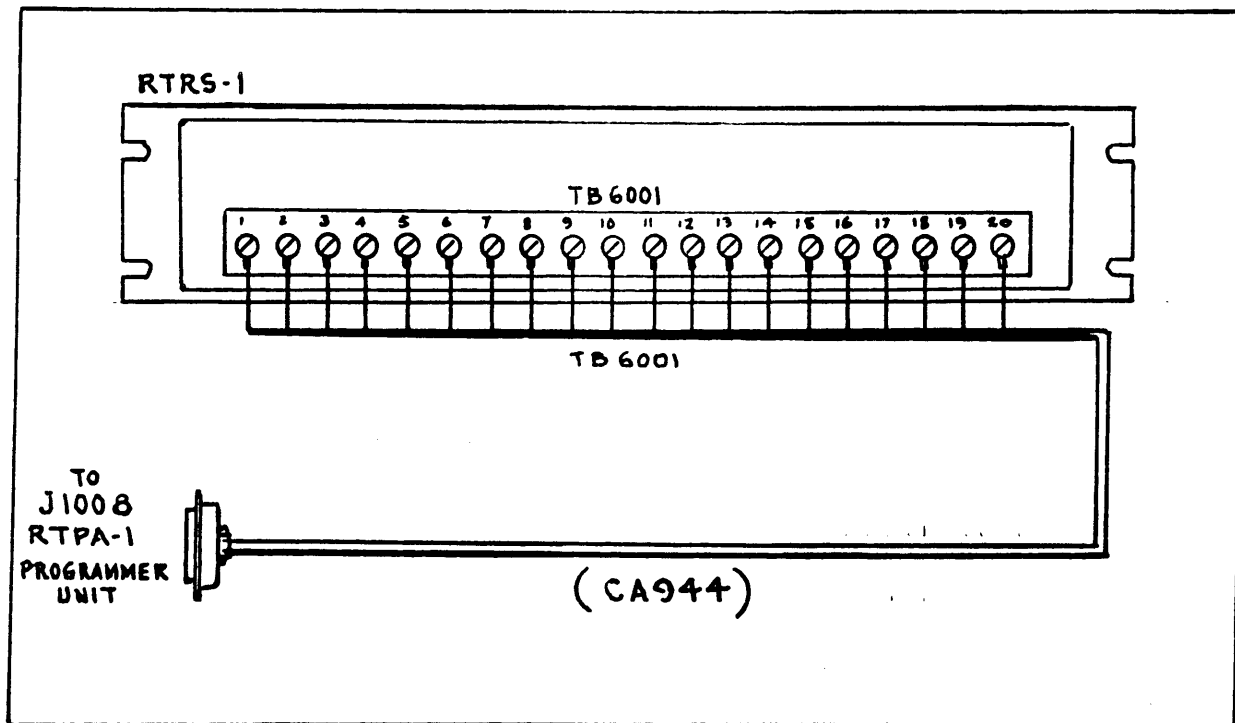


Figure 2-1. Electrical Interconnection Diagram.

SECTION 3
OPERATOR'S SECTION

3-1. GENERAL

The RTRS is designed to manually route an equipment selector tuning code to the input of a programming device (such as model RTPA-1). The tuning code, indicating to the programming device which of the two remote receiver systems is to be tuned, is initiated by pressing one of the two front panel EQUIPMENT SELECTOR pushbuttons.

The NO PUNCH pushbutton is used to disengage the tape punch unit, permitting the selected receiver to be tuned without punching a tape. The PUNCH pushbutton mechanically releases the NO PUNCH pushbutton when pressed. Both pushbuttons light when pressed.

3-2. OPERATOR'S INSTRUCTIONS

The RTRS front panel displays two equipment selector pushbuttons, one for receiver 1 and another for receiver 2. Pressing either pushbutton will determine which of the two receivers will be tuned; pushbutton 1 will route a tuning code for receiver 1 and pushbutton 2 will route a tuning code for receiver 2.

A third pushbutton marked NO PUNCH is used when the operator desires to disengage the external tape punch unit. This feature enables the operator to program a

selected receiver, at the programming unit, without punching a tape. Therefore, the NO PUNCH pushbutton is pressed when a receiver is to be programmed and a punched tape is not desired. When a punched tape is desired the PUNCH pushbutton is pressed, mechanically resetting the NO PUNCH pushbutton, allowing the start process to be routed to the tape punch unit.

3-3. OPERATOR'S MAINTENANCE

The operator may, at certain times, be required to perform various aspects of operator's maintenance. This type of maintenance may consist of simply keeping the unit clean and observing for secure interconnections.

However, should normal operating procedures produce unsatisfactory results, and check of the interconnections and associated equipment levels to the RTRS may clear the fault.

TABLE 3-1. OPERATING CONTROLS

SERIAL DESIGNATION (Figure 3-1)	PANEL DESIGNATION	FUNCTION
1	NO PUNCH, pushbutton	When pressed, permits tuning or programming the external receiver without punching a tape; disconnects external tape punch unit from circuit. Pushbutton lights when pressed.
2	PUNCH, pushbutton	When pressed, permits a tape to be punched while tuning or programming a receiver. Pushbutton lights when pressed.
3	1, receiver selector pushbutton	When pressed, permits the tuning process from the programmer to be routed to receiver system 1. Pushbutton lights when pressed.
4	2, receiver selector pushbutton	When pressed, permits the tuning process from the programmer to be routed to receiver system 2. Pushbutton lights when pressed.

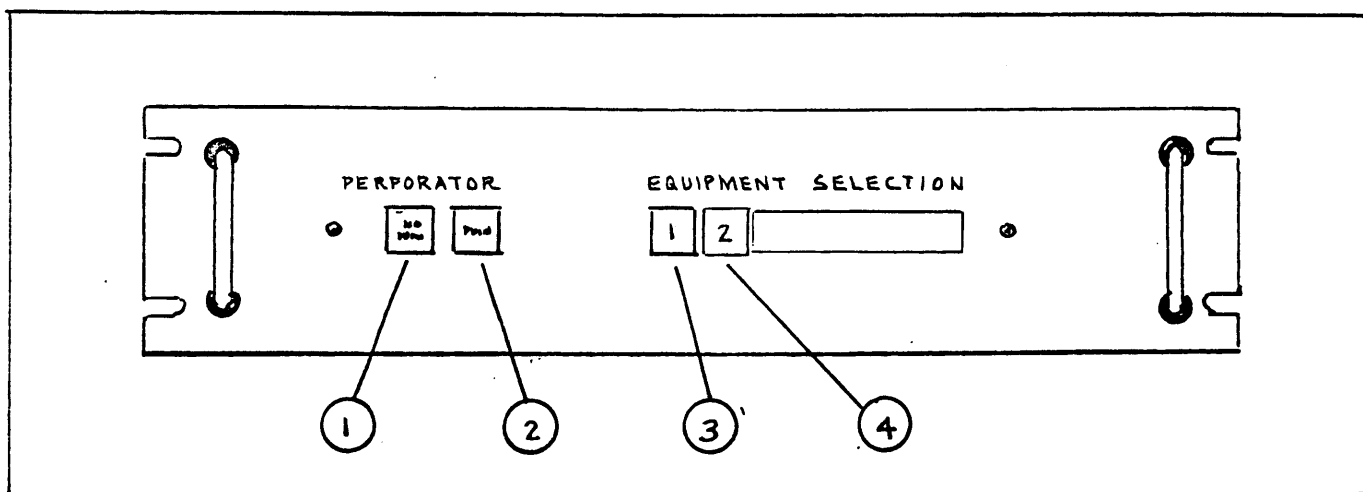


Figure 3-1. Front Panel Controls

SECTION 4

PRINCIPLES OF OPERATION

4-1. INTRODUCTION

The tuning start process from the external programmer is routed to the external tape punch unit through the contacts of a relay, controlled by the NO PUNCH and PUNCH pushbuttons. When the NO PUNCH pushbutton is pressed, the tuning start process is removed from the tape punch unit, permitting manual tuning without punching a tape. Pressing the PUNCH pushbutton, resets the relay, allowing the start process to be routed directly to the tape punch unit. Both NO PUNCH and PUNCH pushbuttons light when pressed, indicating activation.

Pressing either of the two receiver selector pushbuttons 1 or 2, will route a code back to the input circuit of the programmer unit, indicating the particular receiver system to be tuned. Receiver selector pushbuttons 1 and 2 will also light when pressed, indicating activation.

4-2. CIRCUIT DESCRIPTION

The tuning start process signal, from connector J1, pin 35 of the programmer unit, is routed to the tape punch unit through the contacts of a relay, activated by the NO PUNCH pushbutton. Pressing the NO PUNCH pushbutton energizes the relay solenoid, opening the contacts in series with the tuning start process signal to the tape punch unit. This action causes the tape punch unit to be deactivated, indicated by the

NO PUNCH pushbutton lamp being lit.

Pressing the PUNCH pushbutton mechanically resets the NO PUNCH pushbutton, thereby deenergizing the relay and permitting the tuning start process signal to be routed to the tape punch unit. When the PUNCH pushbutton is pressed, it will light, indicating that the punch process is activated.

The normally open five sets of contacts comprising the EQUIPMENT SELECTOR 1 pushbutton, receives an input of -12 volts dc from the external programmer. When pushbutton 1 is pressed, all five sets of contacts close, energizing a relay in the programmer, thus allowing the -12 volts dc to be applied back to the input circuit of the programmer. The input to the programmer, when pushbutton 1 is pressed, is -12 volts dc on the 1-bit line, the 2-bit line and the 4-bit line.

The normally open four sets of contacts, comprising the EQUIPMENT SELECTOR 2 pushbutton, are connected in parallel with the pushbutton 1 contacts. When pressed, -12 volts dc is applied to the input circuit of the programmer on the 1-bit line and the 3-bit line.

Each pushbutton employs an indicator lamp, lighting when pressed. The indicator lamps receive 26 volts a-c from the associated circuitry located in the external RTPA-1 programmer unit.

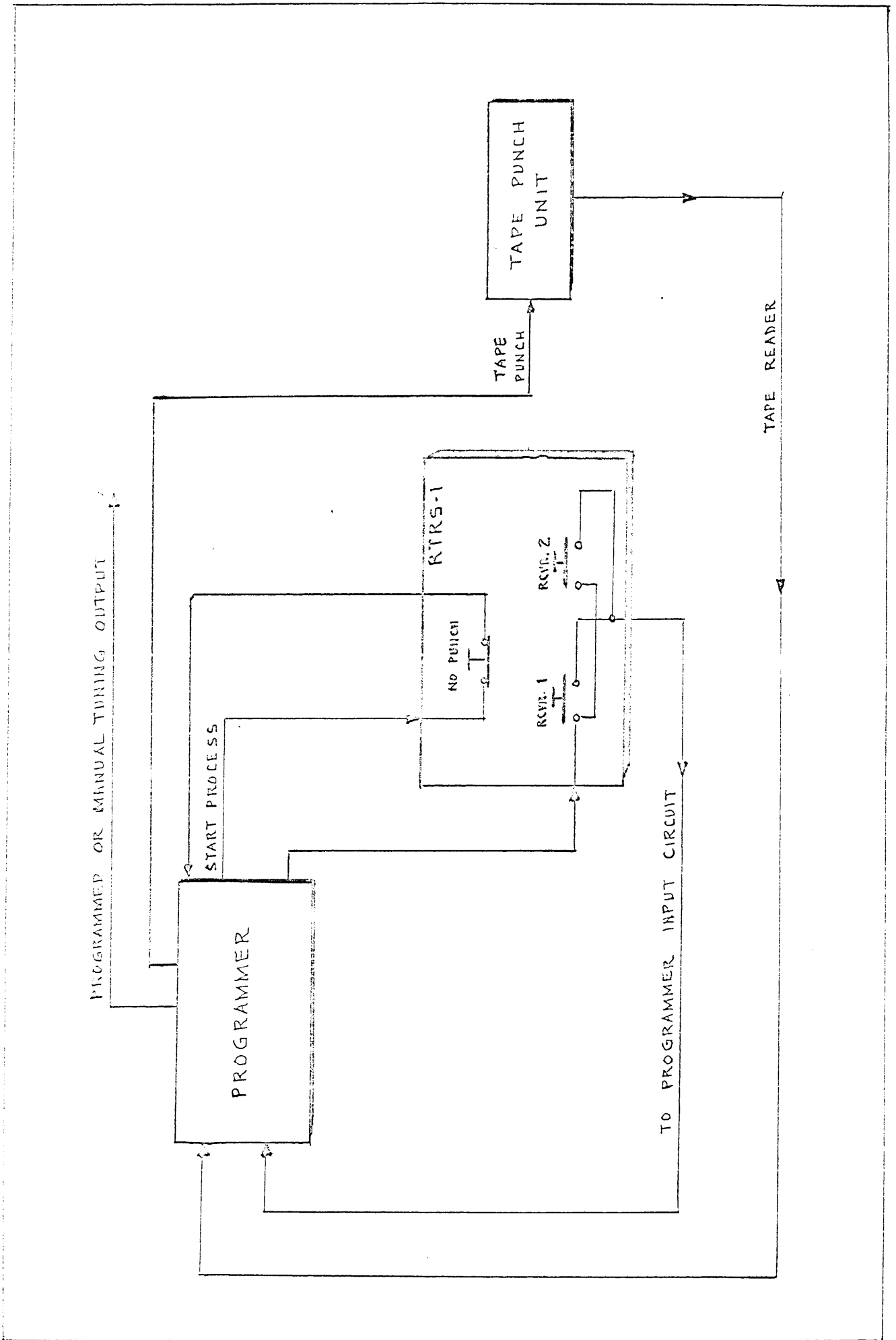


Figure 4-1. Functional Block Diagram

SECTION 5
TROUBLESHOOTING

5-1. INTRODUCTION.

This section explains how to locate and diagnose equipment troubles. By proper use of the various troubleshooting aids provided in this manual, the technician can locate and diagnose the fault at hand.

The following troubleshooting aids are provided.

- a. Troubleshooting techniques. (Paragraph 5-2.)
- b. Functional block diagram (Figure 4-1.)
- c. Schematic diagram (Figure 8-1.)
- d. Pushbutton deck assembly diagram (Figure 5-1.)

5-2. TROUBLESHOOTING TECHNIQUES.

a. GENERAL CONSIDERATIONS-When a piece of equipment has been operating satisfactorily and suddenly fails, the cause of failure may be due to circumstances occurring at the time of failure or due to symptoms of past failures. Therefore, the first check is to ascertain that proper equipment voltages are present and that all interconnecting wires are secure.

If the above mentioned checks fail to locate the fault, the unit should be removed from the cabinet and visually checked for corrosion, dirt, dampness or any other harmful conditions.

b. TROUBLESHOOTING PROCEDURES. - The troubleshooting procedures listed in table 5-1 provide normal indications of all the control functions of the RTRS. If a normal indication is not observed, perform the procedures listed in the third column. If the fault cannot be located after a thorough check of the RTRS, check the input levels to the RTRS from all associated equipment. When troubleshooting, refer to the schematic diagram, figure 8-1.

TABLE 5-1. TROUBLESHOOTING PROCEDURES

CONTROL FUNCTION	NORMAL INDICATION	PROBABLE CAUSE OF MALFUNCTION
<p>NO PUNCH pushbutton pressed</p>	<p>NO PUNCH pushbutton should lock and light. External tape punch unit should not operate.</p>	<p>If NO PUNCH pushbutton does not lock, check condition of locking mechanism and PUNCH pushbutton mechanism. If the pushbutton lamp does not light, check condition of lamp. Check condition of relay solenoid and associated contacts. Check for 26 volts a-c input. If tape punch unit operates, check condition of NO PUNCH pushbutton contacts. Check for 12 volts d-c at switch contacts</p>
<p>PUNCH pushbutton pressed</p>	<p>PUNCH pushbutton should lock and light. NO PUNCH pushbutton should release. Tape punch unit should operate.</p>	<p>If PUNCH pushbutton does not lock, check condition of locking mechanism and NO PUNCH pushbutton mechanism. If the pushbutton lamp does not light, check condition of lamp. Check condition of relay solenoid and associated contacts. Check for 26 volts a-c input.</p> <p>Check for proper input and output wiring connections.</p>

TABLE 5-1. TROUBLESHOOTING PROCEDURES (cont)

CONTROL FUNCTION	NORMAL INDICATION	PROBABLE CAUSE OF MALFUNCTION
<p>Receiver selector 1 or 2 pushbutton pressed</p>	<p>Pushbutton should return to extended position when released. Pushbutton should light when pressed, extinguish when released.</p>	<p>If pushbutton does not return to the extended or normal position when released, check pushbutton return spring for damage or obstruction. If pushbutton lamp does not light when pressed, check condition of lamp. Check condition of lamp switch contacts and presence of 26 v a-c. If proper receiver selection function does not occur, check condition of pushbutton contacts and associated wiring. Check condition and presence of proper voltages at input and output switch contacts.</p>

MECHANICAL
PUSHBUTTON LOCK

PUSHBUTTON
RETURN
SPRING

LAMP
HOLDER

PUSHBUTTON
(PULL TO REMOVE)

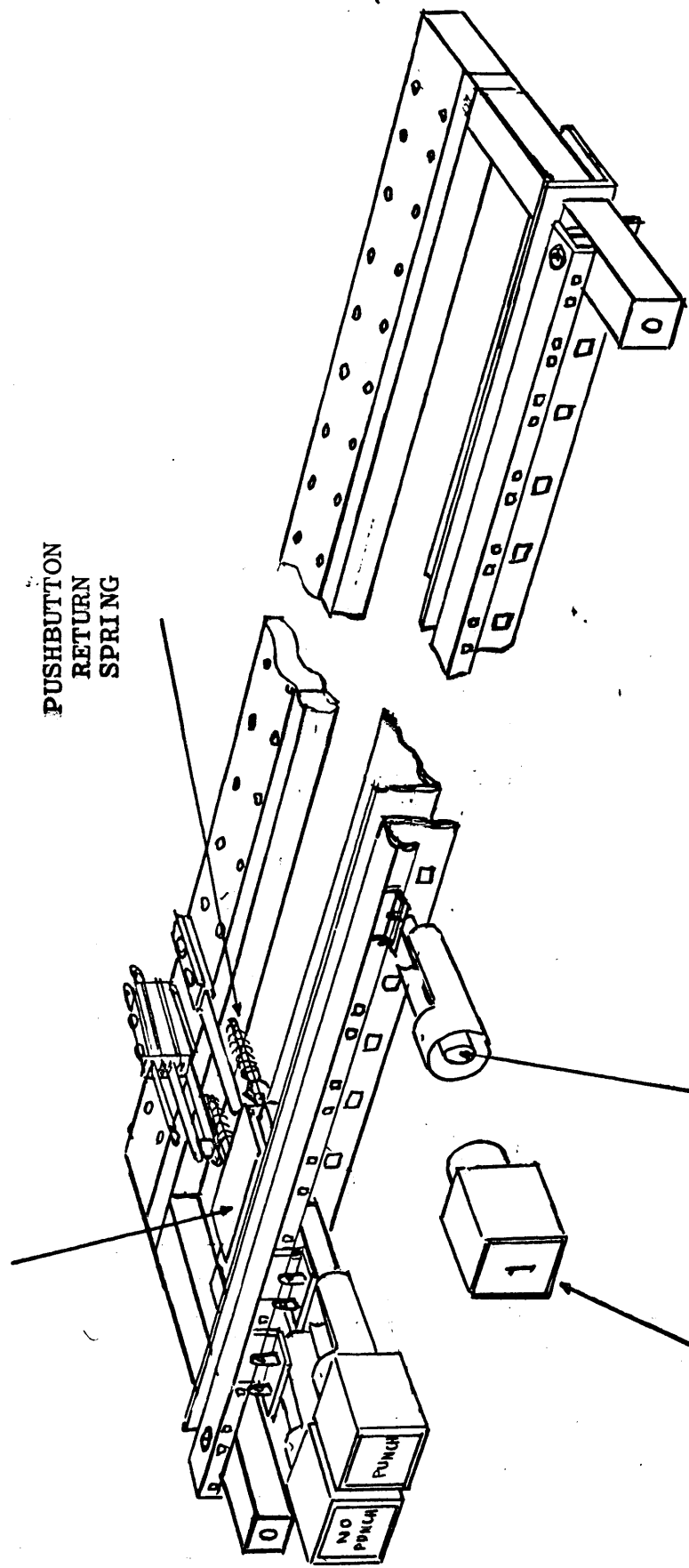


Figure 5-1. Pushbutton Deck, Assembly Diagram.

SECTION 6

MAINTENANCE

6-1. INTRODUCTION

Maintenance may be divided into three categories: operator's maintenance, preventive maintenance and corrective maintenance.

Operator's maintenance procedures are described in paragraph 3-3 of the Operator's Section.

Preventive maintenance procedures, described in paragraph 6-2 of this section, provide information useful in preventing unnecessary equipment failure or malfunctioning.

Corrective maintenance procedures, described in paragraph 6-3 of this section, provide information useful in locating and correcting the cause of equipment failure or malfunctioning.

6-2. PREVENTIVE MAINTENANCE

a. In order to prevent equipment failure due to dust, dirt or other destructive elements, it is suggested that a schedule of preventive maintenance be set up and adhered to.

At periodic intervals, the equipment should be removed from its mounting for cleaning and inspection. The wiring and all components should be inspected for dirt, dust, corrosion, grease or other harmful conditions. Remove dust with a soft brush or vacuum cleaner. Remove dirt or grease

with any suitable cleaning solvent. Use of carbon tetrachloride should be avoided due to its highly toxic effects. Trichlorethylene or methyl chloroform may be used, providing the necessary precautions are observed.

WARNING

When using toxic solvents, make certain that adequate ventilation exists. Avoid prolonged or repeated breathing of the vapor. Avoid prolonged or repeated contact with skin. Flammable solvents shall not be used on energized equipment or near any equipment from which a spark may be received. Smoking, "hot work", etc. is prohibited in the immediate area.

CAUTION

When using trichlorethylene, avoid contact with painted surfaces, due to its paint removing effects.

6-3. CORRECTIVE MAINTENANCE

Corrective maintenance of the RTRS will consist mainly of component replacement. It should be noted that when replacing components having many wires connected, such as switches, relays, etc. the wires should be tagged and marked for accurate identification when replacing. When replacing components, refer to the parts list in section 7 for exact or equivalent replacements. Use of the schematic diagram in section 8 is advisable when replacing or disconnecting components.

SECTION - 7

PARTS LIST

(TO BE SUPPLIED)

SECTION 8
SCHEMATIC DIAGRAMS

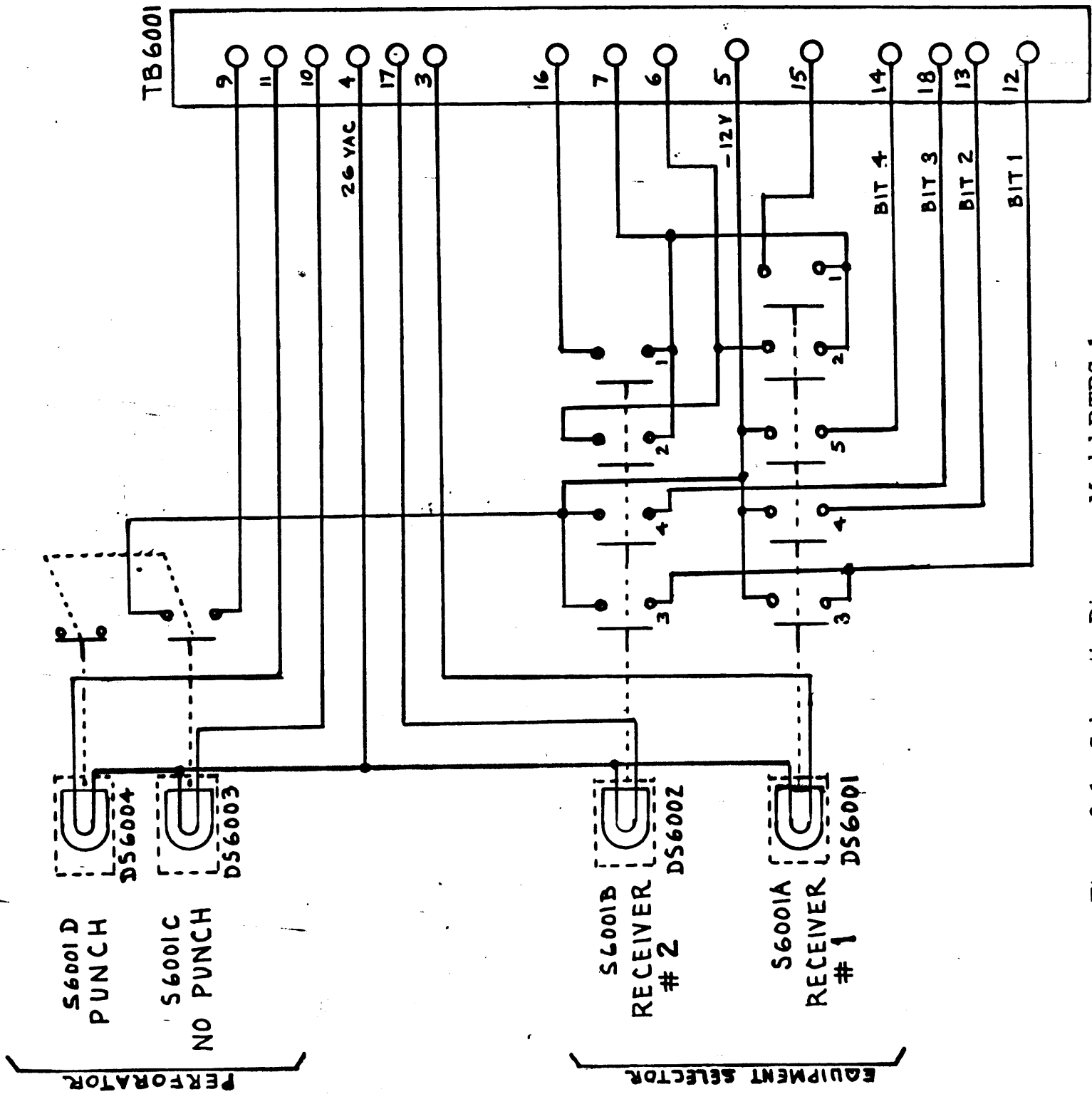


Figure 8-1. Schematic Diagram, Model RTRS-1

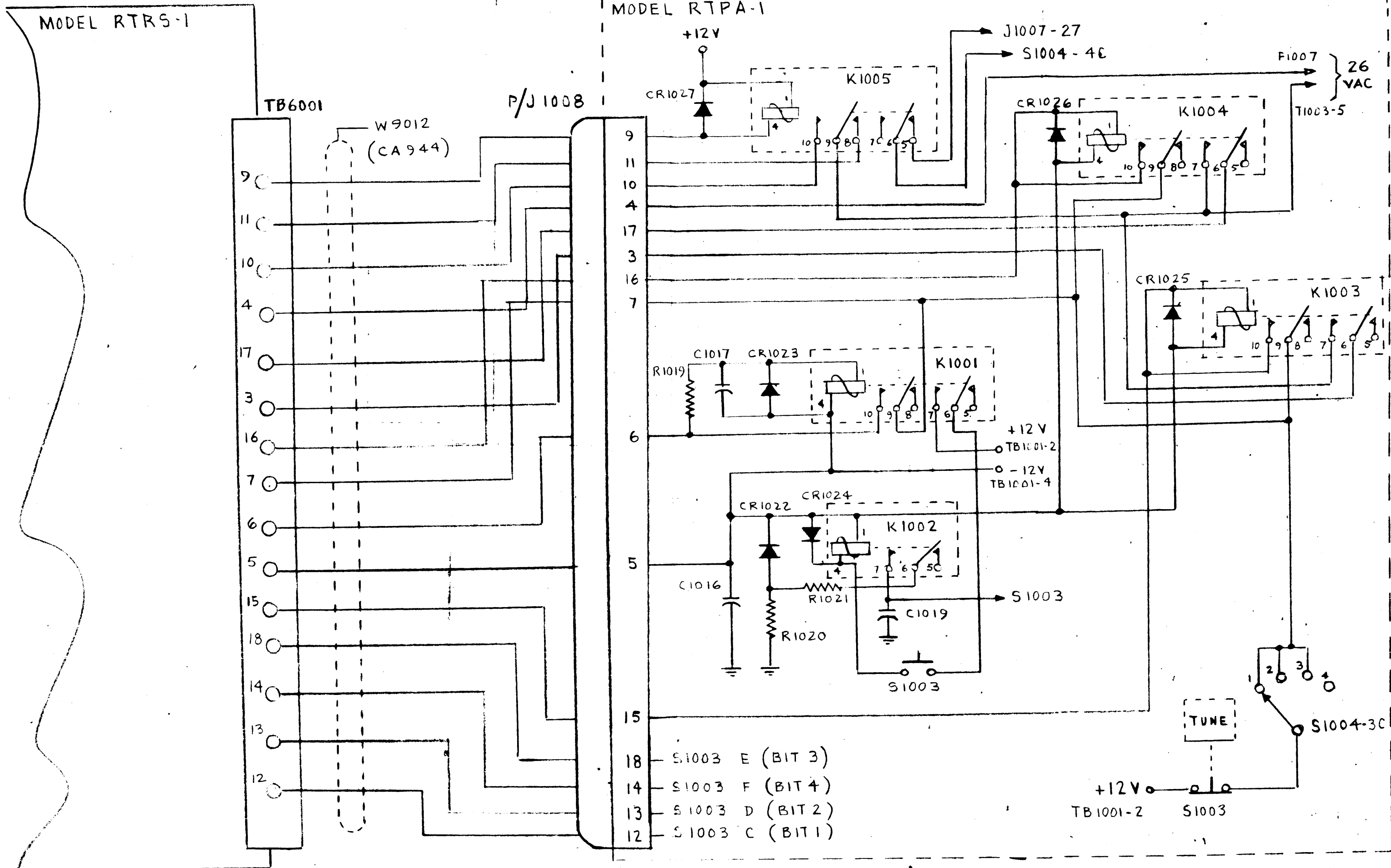


Figure 8-2. Associated Equipment Interconnections